

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of	)	
	)	
Expanding Flexible Use in Mid Band Spectrum	)	GN Docket No. 17-183
Between 3.7 and 24 GHz	)	

To: The Commission

**COMMENTS OF  
ZODIAC INFLIGHT INNOVATIONS**

Steven H. Rines  
Staff Systems Engineer  
**Zodiac Inflight Innovations**  
2929 East Imperial Highway  
Brea, CA 92821  
(714) 854-8713

Zodiac Inflight Innovations (Zii) offers the following comments in response to the Commission's Notice of Inquiry.

### 3.7-4.2 GHz

The frequency range of 3.7 – 4.2 GHz directly abuts the 4.2 – 4.4 GHz international frequency allocation for aircraft radio altimeters. Radio altimetry is a primary service in this band. Radio altimetry provides safety critical sensor data to support manual and automatic landing of aircraft in limited visibility conditions.

A typical FM CW radio altimeter receiver requires a sensitivity of -135 to -137 dBm to reliably produce a valid distance measurement at 5,000 feet.

The current allocation of 3.7 – 4.2 GHz is for non-GSO FSS (S 2 E), television/radio communications. Non-GSO FSS communications are deterministic and well understood.

Use of the 3700 – 4200 MHz band for IMT was requested at the 2015 WRC and was denied due to concerns over interference with Radio altimeters in Working Group 4C. This topic was studied by ITU-R WP5A in advance of 2015 WRC.

It was determined that the interference characteristics of International Mobile Telecommunications (IMT) use of adjacent bands cannot be adequately predicted to ensure continued safe operation of the radio altimeters.

2015 WRC also approved Wireless Avionics Inter-systems Communications (WAIC) as a co-primary service in the 4.2 – 4.4 GHz band for use by aircraft systems associated with aircraft safety and regularity of flight in non-interfering co-existence with radio altimeters.

WAIC systems are now being developed by industry teams working in cooperation with the Aeronautical Vehicular Systems Institute (AVSI), Radio Technical Commission for Aeronautics, Inc. (RTCA) and the International Civil Aviation Organization (ICAO). Considerable effort is being expended to ensure that WAIC systems can safely coexist with radio altimeters within and between military and commercial aircraft.

The interference characteristic of IMT are nondeterministic in application and the potential adjacent frequency band interference with WAIC has not been characterized.

We recommend that FCC proceed with caution to avoid potential interference to existing RA operation and emerging WAIC operations from IMT operation in frequency bands adjacent to the 4.2 – 4.4 GHz frequency band.

### 5.925 – 6.425 GHz and 6.425 – 7.125 GHz

The previous allocation of the 5 GHz band (5.03 – 5.875 GHz) for unlicensed operation produced a significant increase in available spectrum for business and residential wireless systems. The use of that frequency range on aircraft, however, is limited to 5.170 – 5.250 and 5.735 – 5.835 GHz since availability of the rest of the band is unpredictable due to

Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) rules for the protection of weather and terminal operations radar.

The spectrum that is remains in the 5 GHz band outside the DFS channels is insufficient to produce a reliable wireless entertainment and connectivity product for wide body commercial aircraft.

Converting from wired to wireless entertainment services within a commercial aircraft will reduce the weight of each aircraft by over well over 1,000 pounds and produce significant fuel savings for the airlines.

The reallocation of the frequency ranges of 5.925 – 6.425 GHz and 6.425 – 7.125 GHz for unlicensed use by short range devices would be a boon to the aviation industry and the traveling public.